Executive Summary

ENERGY ENGINEERING ANALYSIS PROGRAM FORT BLISS, TX

U S Army Corps of Engineers
Fort Worth District
FORT WORTH, TEXAS

CONTRACT NO. DACA63-79-C-0192

HOUSTON, TEXAS

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ENERGY ENGINEERING ANALYSIS PROGRAM

Fort Bliss, Texas

EXECUTIVE SUMMARY

Prepared for

Department of the Army
Corps of Engineers
Fort Worth District
Fort Worth, Texas

Contract No. DACA63-79-C-0192
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Prepared by
The CRS Group, Inc.
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GENERAL TABLE OF CONTENTS

Within each volume is a detailed Table of Contents for that volume.

1. INTRODUCTION

1.1 The CRS Group, Inc. is pleased to submit this report on Increments A, B, C, D, E, F and G of the Energy Engineering Analysis Program (EEAP) for Fort Bliss, Texas. This work was accomplished under Contract No. DACA63-79-C-0192 with three modifications. The associated volumes, general contents, level of completion and contract modification numbers are listed in TABLE ES1.

TABLE ES1

REPORT SUMMARY

Volume	Contents	Level of Completion	Modification
I	Program Overview	Final Report	P00001
II	Increment A	Final Report	P00001
III	Increment B	Final Report	P00001
IV	Increment E	Final Report	P00001
V	Increment G	Pre-Final Report	P00002
VI	Increments C, D & F	Preliminary Report	P00003
Appendices	Building Data Base	Final Report	P00001

1.1.1 The work presented in these volumes represents final results on Increments A, B and E (and Appendices); pre-final results on Increment G; and preliminary results on Increments C, D and F. As Increments move to final form, this Executive Summary will be updated and will include a summary of the entire Fort Bliss EEAP results. As this work has been done under varying scopes of work, a copy of the applicable scope of work is included in appropriate volumes (specifically in Volume I for Increments A, B and E; in Volume V for Increment G; and in Volume VI for Increments C, D and F).

1.2 Forwarded to FWD and Fort Bliss with this report were copies of the completed ECIP's (DD Forms 1391 and PDB's) from Increments A and B.

1.2.1 TABLE ES2 below summarizes the present completion of the increments of the Fort Bliss EEAP where:

- Phase I: Data gathering and field inspections;
- Phase II: Analysis, project identification, technical feasibility and economic evaluations;
- Phase III: Preparation of DD Forms 1391 and PDB's where applicable and final documentation of results and recommendations.

TABLE ES2

COMPLETION PERCENTAGE
OF FORT BLISS EEAP

Increment / Phase	I	II	III
A - Buildings	100%	100%	100%
B - Utilities/EMCS	100%	100%	100%
C - Solar/Renewable Energy	75%	35%	20%
D - TE & SE	75%	35%	20%
E - Central Boiler Plant	100%	100%	100%
F - Facility Energy Conservation Measures	50%	10%	5%
G - Maintenance/Repair	95%	95%	95%

1.3 It is expected that the Final Report for Increment G will be completed by April 1983. The expected schedule for completion of Increments C, D and F is:

Interim Report by May 1983;

Pre-Final Report by September 1983; and

Final Report by December 1983.

1.4 Overview: This report consists of seven volumes and a set of appendices in which the EEAP results to date are presented. All calculational routines for the analyzed Energy Conserving Measures (ECM's) are either explicitly presented or the computer code employed is referenced. The purpose of the presentation is to allow others to follow the procedures in a straight-forward manner. Costs of implementing an ECM are also shown, broken out by labor and material where applicable, referenced and adjusted to the Fort Bliss market. Where appropriate, applicability lists have been prepared identifying where the ECM's are to be implemented. Additionally, ECIP Economic Analysis Summary Sheets and Detailed Cost Estimates are included. A brief overview of each volume is presented below.

1.4.1 Volume I (Final) presents general information used throughout the program. The EEAP objectives are reviewed, and the contract and modifications are identified. While a data base of building information was available, there was some question as to its accuracy and adequacy for EEAP application. An extensive verification procedure was carried out including checking of as-built drawings and site visits to buildings. The data base was found adequate for use in calculating potential energy savings once updating and minor corrections were incorporated. (The corrected data base is presented as part of the Appendices volume.)

1.4.1.1 A detailed Baseline Assessment of Fort Bliss was carried out which covered applicable previous work, local climate, energy consumption history, energy costs and end use. Factors which could impact the implementation of an ECM were investigated. A summary of results is presented, which is also reproduced in this Executive Summary, Section 2. Finally, the Scope of Work for this contract and modification, References, Abbreviations and Acronyms are presented. (The References, Abbreviations and Acronyms section is included in each volume to aid the reader.)

1.4.2 Volume II (Final) contains the methodology used, analysis and summary of the ECM's investigated for Increment A: Buildings including Family Housing.

1.4.3 Volume III (Final) contains the Increment B work. Covered in this volume are the methodology, a baseline assessment and analysis of ECM's relevant to the utilities and distribution systems at Fort Bliss. The EMCS methodology, analysis and results are presented, and a section on metering is included.

1.4.4 Volume IV (Final) presents the work completed under Increment E and contains an introduction, the methodology, the analysis and a summary of results relating to the Central Boiler Plant study.

1.4.5 Volume V (Pre-Final) presents Increment G work - a detailed analysis of those ECM's developed in Increments A and B which did not qualify under the ECIP criteria. Included in this volume is an investigation of possible modifications to the William Beaumont Army Medical Center.

1.4.6 Volume VI (Preliminary) covers the work to date under Increments C, D and F.

1.4.7 The Appendices Volume (Final) contains the Fort Bliss EEAP data base consisting of:

Appendix I : Building Locator
Appendix II : Index Building Data
Appendix III: Duplicate Building List
Appendix IV : Recent Construction
Appendix V : Low Energy Use Building List

2. EXISTING ENERGY CONSUMPTION

2.1 Basewide Consumption FY75

The vast majority of consumed energy at Fort Bliss consists of electricity and natural gas. In FY75, Fort Bliss used 1,485,414 source MBtu (millions of Btu) or 128,052,919 metered kWh of electricity at a cost of over $2.2 million. During that same period, 1,594,200 source MBtu of natural gas were purchased for $1.1 million.

2.1.1 Additionally, liquid petroleum products were also used at Fort Bliss. The records indicate that significant amounts of the following fuels were consumed during FY75:

- JP-4 (aviation turbine fuel): 19,946 barrels;
- Motor gasoline: 34,494 barrels;
- Diesel fuel: 24,547 barrels.

2.2 Basewide Consumption FY80

In FY80, 1,571,531 source MBtu (135,476,792 metered kWh) of electricity at a cost of over $5.4 million were used. During that same period, 1,287,913 source MBtu of natural gas were purchased for over $2.8 million.

2.2.1 The overall use of other liquid petroleum products shows an increase in FY80 due to a large increase in the use of diesel fuel with slight decreases in aviation turbine fuel and motor gasoline. The number of gallons used, with the percentage increase or decrease over FY75 use, was:

- JP-4 (aviation turbine fuel): 17,288 barrels (-13.3%);
- Motor gasoline: 33,626 barrels (- 2.5%);
- Diesel fuel: 42,512 barrels (+85.4%).

3. RESULTS - INCREMENTS A AND B (FINAL)

3.1 Twenty-seven energy conserving measures (ECM's) were investigated for implementation at Fort Bliss, Texas for Increments A and B. Of these 27 ECM's, 13 met ECIP criteria. Grouping of projects into ECIP packages has been utilized to minimize disruption to occupants and to develop work packages which have the best overall value to the U. S. Army. This repackaging of the 13 projects resulted in seven ECIP's which have been completed (DD Forms 1391 and PDB's) and forwarded to the appropriate personnel at FWD and Fort Bliss.

3.2 The seven ECIP's are summarized in TABLE ES3. Note that ECIP T-484 (Family Housing) has been submitted by Fort Bliss for funding. Funding has been approved, and a contract for design has been let. The ECM's which were investigated but did not meet ECIP criteria for Increments A and B are summarized in TABLE ES4.

TABLE ES3

PROJECTS RECOMMENDED FOR FUNDING: INCREMENT A

	TITLE	SOURCE ENERGY SAVED (MBtu/yr)	CWE ($x1000)	E/C	B/C	PAYBACK (YRS)	SOURCE GAS SAVED (MBtu/yr)	SOURCE ELEC. SAVED (MBtu/yr)	SAVINGS ($x1000)
T-484	Family Housing ECIP: Auto. Setback Thermostat Flow Restrict. Shower Insulate Water Heater Fluor. Kitchen Fixture	75,337	1,058.9	71.0	3.6	3.4	65,858	9,479	309.5
T-485	Barracks Energy Alterations ECIP: Flow Restrict. Shower Radiator Temp. Control	84,513	1,540.9	54.8	3.6	3.5	83,034	1,479	441.5
T-486	Laundry Heat Recovery ECIP: Water Heat Recovery Dryer Heat Recovery	6,020	330.5	18.2	1.1	11.2	6,359	-339	28.9
T-488	Boiler Alterations ECIP: Turbulators Flue-Gas Analyzer	16,946	307.1	55.2	2.1	3.5	16,946*	-0-	89.3
T-489	AFH Evap. Cooler FM Controls ECIP:	16,865	804.0	21.0	2.1	6.9	-0-	16,865	116.8
T-490	Evap. Cooler FM Controls ECIP:	22,779	307.7	74.0	7.9	1.6	-0-	22,779	189.0
	INCREMENT A TOTALS	222,460	4,349.1	51.2	3.9	3.7	172,197	50,263	1,174.0

* This includes: 13,070 MBtu/yr Natural Gas & 3,876 MBtu/yr Fuel Oil (source).

PROJECTS RECOMMENDED FOR FUNDING: INCREMENT B

T-483	EMCS	44,637	1,007.7	44.3	3.4	3.8	7,413	37,224	268.5

TABLE ES4
ECM'S NOT RECOMMENDED FOR FUNDING

PROJECT	E/C
AFH Electronic Furnace Ignition (1)	27.1
Family Housing Floor Insulation	10.4
Family Housing Wall Insulation**	9.1
Family Housing Storm Windows**	9.0
Family Housing Solar Hot Water	7.1
Wall Insulation**	3.9
Roof Insulation (2)	N/A
Replace Transformers (3)**	9.5
Replace Overhead Conductors	LOW
Capacitance Correction Basewide	LOW
High Efficiency Pump Motors	
Water	less than 6.0
Sewer	less than 6.0
Drainage	less than 6.0
Improved Pump Motor Power Factor	LOW

** Highest Value

(1) Approximately 75% of the savings from installation of electronic furnace ignition is already being realized as post personnel turn the pilot lights off in the summer and on in the winter during normal maintenance procedures.
(2) No additional buildings beyond previous Post ECIP submission meet ECIP criteria.
(3) B/C = 0.74.

4. RESULTS - INCREMENT E (FINAL)

4.1 Introduction

Increment E studies central boiler plant energy generation and distribution. The primary Army objective is to reduce energy dependency on petroleum fuels by changing to coal, supplemented with biomass (wood and refuse derived fuels), and using oil as a back-up fuel.

4.2 Methodology

Five basic steps comprise the determination of Central Energy Plant (CEP) feasibility:

- A baseline load assessment sizing the central plant;
- A cost estimate of the plant and other central facilities;
- A cost estimate of piping and other distributed facilities;
- A life cycle cost estimate of the central plant and associated facilities; and
- A benefit-to-cost analysis of the central plant and associated facilities.

4.3 Results

Throughout Fort Bliss, the economics of central plant conversion are generally uniform and generally unattractive. Benefit-to-cost (B/C) ratios for subgroups on the main base and outlying areas range between 0.29 and 0.67 with an overall average of 0.53. (The E/C ratios for all CEP increments equal zero as no energy is actually saved.)

4.3.1 Unless some specific weight is given the Army Facilities Energy Plan (AFEP) goal of eliminating nonrenewable resource consumption - e.g., revising the economic assumptions or targeting a B/C less than 1.0 - no portion of this project can be justified.

4.4 Recommendation

The economic analysis of a coal-fired central boiler plant at Fort Bliss clearly indicates that such a plant, whether sized for the whole base or for discrete parts of the base, would not be cost effective and would not save energy.

5. RESULTS - INCREMENT G (PRE-FINAL)

5.1 Introduction

Basically, the projects selected for analysis and applicability evaluation for Increment G are projects which did not meet ECIP criteria but are felt to have reasonable potential for saving energy as maintenance, repair or minor construction projects.

5.2 Methodology

The methodology used to arrive at the potential list of projects and to provide the proper analysis and documentation is outlined in the following steps:

- Assembly of potential projects in discussion with Post personnel;
- Selection of projects which did not meet ECIP criteria but still had energy saving potential and are of interest to the Post;
- Selection of other potential projects of interest to the Post;
- Utilization of any previous analysis work done in Increments A and B;
- Updating of cost and manpower estimates; and
- For the purpose of relative comparisons in determining costs, it is assumed that all work would be contracted out per Post recommendation. However, sufficient detail is provided to allow the Post to make adjustments for the alternative of using existing staff when feasible.

5.3 Results

The results of the projects analyzed are presented in TABLE ES5 showing CWE (FY86), E/C, B/C, Payback, Source Gas and Electric savings and annual dollar savings (FY86). All projects were evaluated for FY86 implementation.

TABLE ES5
SUMMARY OF INCREMENT G RESULTS

Title	CWE (FY86) ($)	E/C	B/C	Payback (years)	Source Gas Saved* (MBtu/yr)	Source Electricity Saved (MBtu/yr)	Total Source Energy Saved (MBtu/yr)	Annual $ Savings (FY86$)
Energy Analysis for William Beaumont Army Medical Center								
Replacement of Heating Coils	*** No energy savings, although comfort would be improved. ***							
Winter Cooling Modifications	296,531	5.2	0.46	25.3	0	1,526	1,526	11,720
Power Factor Correction	6,391	317.5	42.50	0.4	0	2,029.2	2,029.2	15,789
Solar Film - Unshaded Windows	68,350	9.1	0.83	10.3	759.0	1,379.9	620.9	6,666
Shaded Windows	68,350	6.9	0.50	17.3	126.8	600.2	473.4	3,951
High-Efficiency Air Washer Evaporators in Barracks	1,291,627	14.6	0.93	8.9	0	18,874.3	18,874.3	144,952
Insulating Uninsulated Floors	738,402	6.2	0.63	30.0	4,179.5	380.1	4,599.6	24,569
Caulk and Weatherstrip Family Housing	3,375,790	4.5	0.11	43.0	15,141.0	0	15,141.0	78,430
Door Weatherstripping	473,808	11.2	0.28	17.2	5,331.3	0	5,331.3	27,616
Window Caulking	882,075	5.4	0.13	35.7	4,769.7	0	4,769.7	24,707
Door Caulking	352,625	5.4	0.13	35.7	1,906.1	0	1,906.1	9,874
Window Weatherstripping	1,667,403	1.9	0.05	102.7	3,133.9	0	3,133.9	16,234
Powered Attic Ventilation in Family Housing	*** Power ventilators consume more energy than they save. ***							
Wind Driven Attic Ventilation in Family Housing	160,605	2.4	0.15	53.7	0	388.6	388.6	2,984

* Negative (-) energy saved implies that energy requirements increase with implementation of this project.

6. RESULTS - INCREMENT C (PRELIMINARY)

6.1 Introduction

One of the goals stated in the Army Facilities Energy Plan is to provide one percent of Army facility energy from solar energy by FY85. To do so, the solar application must be cost-effective and practical. Preliminary Increment C results look positive, but more specific applications must now be chosen for further detailed analysis.

6.2 Methodology

Six basic steps comprise the determination of feasibility for solar energy projects at Fort Bliss, Texas:

- A grouping of buildings by similar energy requirements and use profiles;
- A description of solar system concepts to be utilized;
- A cost estimate of the system and associated equipment;
- An analysis of the potential for solar energy systems;
- A life cycle cost estimate for each solar project; and
- An escalated payback analysis for economic feasibility.

6.2.1 Grouping the buildings by similar energy characteristics identified two major building occupancy types which were compatible with the loading requirements on a solar system. Barracks usually have space heating loads and domestic hot water requirements that produce a

relatively uniform profile throughout the year. This makes these structures amenable to solar system applications. Family Housing loads are more diverse than those in the Barracks, but the capability of serving more than one unit with a single central array allows the solar system to be designed to meet these loads.

6.3 Analysis

Four solar system concepts were analyzed. These were:

- Barracks, single array providing space heating and domestic hot water;
- Family Housing, single array providing space heating and domestic hot water;
- Family Housing, central array providing space heating and domestic hot water; and
- Family Housing, central array providing domestic hot water.

6.3.1 Equipment costs were obtained from a national manufacturer and were assumed to be representative of those in the industry. Costs were escalated using the indices in EIRS Bulletin 82-02 update to AR415-17. All costs are based on a mid-construction date of April 1985 and include design, contingency and supervision, inspection and overhead (SIOH).

6.3.2 A technical analysis of each concept was performed using the SOLCOST computer program. Energy requirements were obtained from the building data base information in the Appendix of this report. Additional data on loads and hourly profiles was obtained from the ASHRAE Handbook.

6.3.3 Life-cycle cost estimates are based on a 25 year period of study and follow the guidelines detailed in Engineering Instructions for Preparation of Feasibility Studies for Total Energy, Selective Energy and Heat Pump Systems, dated 1 July 1977 and Change-1 dated 1 August 1978. Life cycle costs are the sum of the initial costs and the present worth of all operating costs.

6.3.4 Escalated payback calculations and determination of cost effectiveness are derived from information presented in ETL 1110-3-302, Evaluation of Solar Energy, 14 March 1979. The criterion for cost effectiveness is stated there as:

> If the 25 year energy (operating cost) savings, exclusive of any maintenance and replacement costs, exceed the original investment cost differential, the original cost differential is to be considered recovered and the solar energy application becomes cost effective.

6.4 Results

All four concepts evaluated were found to be cost effective with escalated payback periods ranging from 7.8 to 12.8 years. Benefit-to-cost ratios ranged from 0.95 to 1.62 indicating that some of the concepts had load profiles that were not matched to the solar system characteristics. The results are summarized in TABLE ES6.

TABLE ES6

SOLAR SYSTEM FEASIBILITY RESULTS

Concept Description	Collector Area (sq. ft.)	Solar Fraction	System Cost (April 85)	Annual Fuel Savings (MBtu/yr)	Escalated Payback (years)	B/C
Barracks Single Array (DHW,SH)*	3,040	0.447	$132,812	1,283	7.8	1.25
Family Housing Single Array (DHW,SH)	126	0.372	$ 9,383	44	12.8	0.95
Central Array (DHW,SH)	1,617	0.304	$ 81,193	536	10.2	1.06
Central Array (DHW)	336	0.871	$ 18,245	172	7.9	1.62

* DHW = Domestic Hot Water application.
SH = Space Heating application.

6.5 Recommendations

At the present time, it appears that solar systems are cost effective when applied to Barracks and Family Housing loads. Fort Bliss now needs to define the two specific applications called for in the Scope of Work to be completely analyzed. Once the final two system applications are chosen, the following work will be performed for submission:

- More cost data will be acquired to reflect the cost of equipment in the El Paso area;
- In addition, load data for the two chosen applications will be examined in more detail;
- Final results for the two solar applications will be prepared;
- Documentation of the operational characteristics of the existing solar system at WBAMC will be done after a complete year of operation; and
- Other renewable energy sources such as geothermal, wind and solar ponds will be analyzed to see if there are opportunities for application at Fort Bliss. Particular attention will be paid to solar ponds and geothermal applications since other studies of the surrounding region have indicated a reasonable potential for use of these renewable energy sources.

7. RESULTS - INCREMENT D (PRELIMINARY)

7.1 Introduction

Increment D work calls for feasibility determination of new cogeneration and solid waste plants utilizing solid fuels, supplemented, as feasible, with refuse derived fuels and waste oil fuels.

7.2 Methodology

Nine basic steps comprise the determination of Total Energy and Selective Energy Systems feasibility. These steps are as follows:

- An assessment of hourly and seasonal electric and thermal load profiles;
- An analysis of the characteristics of the cogeneration system necessary to meet the requirements of Increment D;
- Integration of the electric and thermal load profiles and the input/output characteristics of specific cogeneration equipment;
- A cost estimate of the Total Energy/Selective Energy cogeneration central plant and the associated central facilities;
- A cost estimate for primary and secondary electrical and thermal distributions systems;
- An analysis of the cogeneration rate structure of the local utility;
- A life-cycle cost estimate of the Total/Selective Energy system;
- A life-cycle benefit analysis of the displaced natural gas and electricity; and
- Certification under the Public Utility Regulatory Policies Act (PURPA) of 1978.

7.3 Results

Preliminary results of this Increment D analysis indicate that in the 1987 time frame (in 1987 dollars) a Total Energy concept for Fort Bliss, Texas will show a benefit-to-cost (B/C) ratio less than one (B/C = 0.88) and an energy saved-to-cost ratio (E/C) equal to zero (E/C = 0.0). This indicates that a Total Energy System cogeneration project for Fort Bliss is not feasible as there is no actual energy saved with the installation of a Total Energy System. This is due to the lack of a year round thermal load large enough to cause the Total Energy System to operate near its maximum efficiency.

7.3.1 The specific energy/economic values summarizing this Increment D Total Energy System analysis are as follows:

- Total Source Energy Saved (MBtu/yr): 0.0 (no energy saved);
- Total Dollars Saved: $ 0.0;
- Construction Working Estimate: $173,936,000 (April 1986) (Total escalated contract cost minus escalated design cost);
- Simple Payback: Project will not pay back;
- E/C Ratio: 0.0 (no energy saved);
- B/C Ratio: 0.88.

7.3.2 A summary of the energy/economic values for Selective Energy at Fort Bliss, Texas will be presented in the Increment D Interim Report.

7.4 Recommendations

Preliminary recommendations of this Increment D Total Energy System analysis are as follows:

- Neglect any consideration of Total Energy System cogeneration at Fort Bliss due to the fact that any Total Energy System will actually consume more energy than the present systems; and
- Detail a process by which the military community at Fort Bliss could become aware of limited cogeneration opportunities in the future and integrate these opportunities with the local utility (El Paso Electric Company). This should be done in such a way that the utility can maintain its corporate profit margin while providing limited cogeneration systems for the military.

7.4.1 Preliminary recommendations for Selective Energy System analysis are:

- Resolve the conflict between the existing DHW solar system at WBAMC and a proposed Selective Energy System;
- If the conflict is resolved, then perform a complete SE System feasibility study for WBAMC as there are relatively large and concentrated loads at this facility; and
- Identify any other large, concentrated loads which could benefit from a SE System.

7.4.3 Integration of the basic recommendations of this report with the present AFEP energy goals should provide Fort Bliss with an analytical methodology which will allow cogeneration to be placed in proper perspective with respect to overall energy conservation economics.

8. RESULTS - INCREMENT F (PRELIMINARY)

8.1 Introduction

The purpose of Increment F is summarized below:

- To provide recommendations for modifications and changes in system operation which are within the Facilities Engineer Funding authority and management control; and
- To summarize and prioritize all energy conservation measures and projects from Increments A, B, F and G for the use of the Installation Commander and Facilities Engineer in developing their energy management plans.

8.2 Proposed Action: As no "...site specific list of buildings and systems to be surveyed..." was received per paragraph 3.5.6.6 of the General Scope of Work, site surveys have not yet occurred. Therefore, the following plan of action is proposed:

- Meet with Post personnel to determine the buildings and systems to be surveyed. It is proposed that this meeting occur when the presentation for this submittal is made;
- Conduct the appropriate site surveys;
- Meet with Post personnel to discuss the results of the surveys;
- Prepare summary documentation of the surveys and meeting and submit same to the Contracting Officer per the Detailed Scope of Work; and
- Continue towards the interim submittal.

8.2.1 The goal of the proposed action is to coordinate the Increment F work so that the results are integrated with other ongoing work (e.g., Increments C and D). In this manner, Increment F will respond to the needs of Fort Bliss in coordinating a master plan for energy conservation.

9. ENERGY PLAN

9.1 Matrix of Actions and Savings

The totals for the implementation of the seven ECIP's are summarized below:

Energy Savings	:	87,487 MBtu/yr (source) Electric
		175,734 MBtu/yr (source) Gas
		3,876 MBtu/yr (source) Fuel Oil
Total Energy Savings	:	267,097 MBtu/yr (source) Energy
CWE (FY86)*	:	$ 5,356,800
Annual $ Savings	:	$ 1,442,500
E/C	:	49.9
Payback	:	3.7 years

*Note that the Family Housing ECIP was prepared for FY84 implementation, and the project has been funded. All other ECIP's were calculated for FY86 implementation.

9.1.1 The savings from these seven ECIP's are shown in TABLE ES7 where a comparison to FY75 energy use is made.

TABLE ES7

ECIP ENERGY SAVINGS AND COMPARISON TO FY75 USE

FY75 USE:	
Electricity:	1,485,414 MBtu (source)
Gas:	1,594,200 MBtu (source)
TOTAL:	3,079,614 MBtu (source)
ECIP SAVINGS:	
Electricity:	87,487 MBtu (source)
Gas & Fuel Oil:	179,610 MBtu (source)
TOTAL:	267,097 MBtu (source)
PERCENT REDUCTION:	
Electricity:	87,487/1,485,414 = 5.9%
Gas & Fuel Oil	179,610/1,594,200 = 11.3%
TOTAL:	267,097/3,079,614 = 8.7%

10. RECOMMENDATIONS

10.1 It is recommended that all seven ECIP's from Increments A and B be funded. (The Family Housing ECIP already has been.)

10.2 Implementation of these ECIP's will reduce by 8.7 percent (FY75 base year) energy consumption at Fort Bliss - an Army facility which has implemented energy conserving modifications successfully in the past (e.g., delamping, lowering thermostat setpoints, turning off Family Housing heater pilot lights in the summer, etc.).

10.3 Preliminary Increment C results are positive, and a realistic aggressive plan for solar application should be pursued. Specific applications must now be identified for the next phase of work.

10.4 Preliminary Increment D results indicate that in the 1987 time frame, a Total Energy concept saves no energy, has a benefit-to-cost ratio of less than 1.0 and therefore does not meet the Army's goals. Future work should concentrate on Selective Energy applications.

10.5 Increment F work has just begun, but the proposed plan of action will result in a coordinated master plan for energy conservation for Fort Bliss, Texas.